

Appendix B – Hydraulic Calculations

- Storm Drain Full Flow Capacity Calculation
- WSPG Models
 - Symphony CD Mainline 1

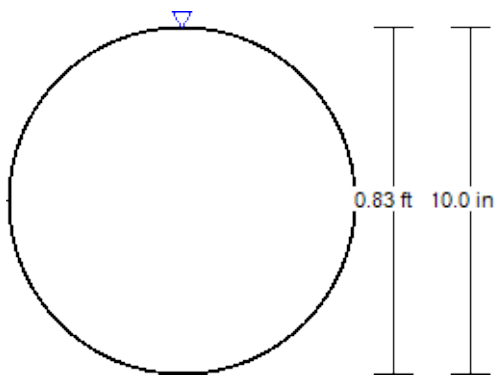
Worksheet for 10" FULL FLOW @ 1.75%

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity
Input Data	
Roughness Coefficient	0.013
Channel Slope	1.75 %
Normal Depth	0.83 ft
Diameter	10.0 in
Discharge	2.90 cfs
Results	
Discharge	2.90 cfs
Normal Depth	0.83 ft
Flow Area	0.5 ft ²
Wetted Perimeter	2.62 ft
Hydraulic Radius	0.21 ft
Top Width	0.00 ft
Critical Depth	0.74 ft
Percent Full	100.0 %
Critical Slope	1.55 %
Velocity	5.31 ft/s
Velocity Head	0.44 ft
Specific Energy	1.27 ft
Froude Number	(N/A)
Maximum Discharge	3.12 cfs
Discharge Full	2.90 cfs
Slope Full	1.75 %
Flow Type	Undefined
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	100.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.83 ft
Critical Depth	0.74 ft
Channel Slope	1.75 %
Critical Slope	1.55 %

Cross Section for 10" FULL FLOW @ 1.75%

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity

Input Data	
Roughness Coefficient	0.013
Channel Slope	1.75 %
Normal Depth	0.83 ft
Diameter	10.0 in
Discharge	2.90 cfs



V: 1
H: 1

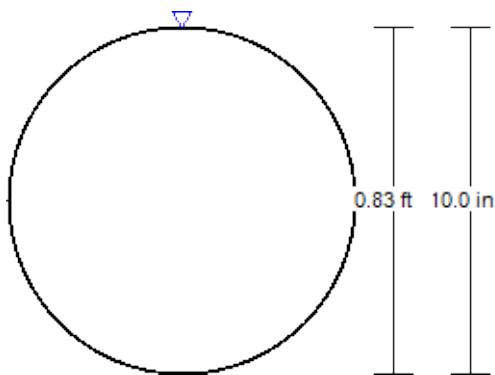
Worksheet for 10" FULL FLOW @ 2.01%

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity
Input Data	
Roughness Coefficient	0.013
Channel Slope	2.01 %
Normal Depth	0.83 ft
Diameter	10.0 in
Discharge	3.11 cfs
Results	
Discharge	3.11 cfs
Normal Depth	0.83 ft
Flow Area	0.5 ft ²
Wetted Perimeter	2.62 ft
Hydraulic Radius	0.21 ft
Top Width	0.00 ft
Critical Depth	0.76 ft
Percent Full	100.0 %
Critical Slope	1.75 %
Velocity	5.69 ft/s
Velocity Head	0.50 ft
Specific Energy	1.34 ft
Froude Number	(N/A)
Maximum Discharge	3.34 cfs
Discharge Full	3.11 cfs
Slope Full	2.01 %
Flow Type	Undefined
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	100.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.83 ft
Critical Depth	0.76 ft
Channel Slope	2.01 %
Critical Slope	1.75 %

Cross Section for 10" FULL FLOW @ 2.01%

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity

Input Data	
Roughness Coefficient	0.013
Channel Slope	2.01 %
Normal Depth	0.83 ft
Diameter	10.0 in
Discharge	3.11 cfs



V: 1
H: 1

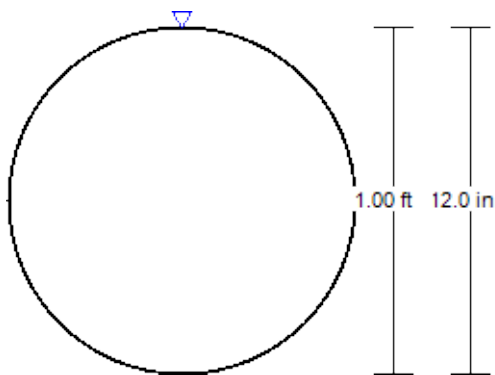
Worksheet for 12" FULL FLOW @ 1.75%

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity
Input Data	
Roughness Coefficient	0.013
Channel Slope	1.75 %
Normal Depth	1.00 ft
Diameter	12.0 in
Discharge	4.71 cfs
Results	
Discharge	4.71 cfs
Normal Depth	1.00 ft
Flow Area	0.8 ft ²
Wetted Perimeter	3.14 ft
Hydraulic Radius	0.25 ft
Top Width	0.00 ft
Critical Depth	0.90 ft
Percent Full	100.0 %
Critical Slope	1.54 %
Velocity	6.00 ft/s
Velocity Head	0.56 ft
Specific Energy	1.56 ft
Froude Number	(N/A)
Maximum Discharge	5.07 cfs
Discharge Full	4.71 cfs
Slope Full	1.75 %
Flow Type	Undefined
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	100.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	1.00 ft
Critical Depth	0.90 ft
Channel Slope	1.75 %
Critical Slope	1.54 %

Cross Section for 12" FULL FLOW @ 1.75%

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity

Input Data	
Roughness Coefficient	0.013
Channel Slope	1.75 %
Normal Depth	1.00 ft
Diameter	12.0 in
Discharge	4.71 cfs



V: 1
H: 1

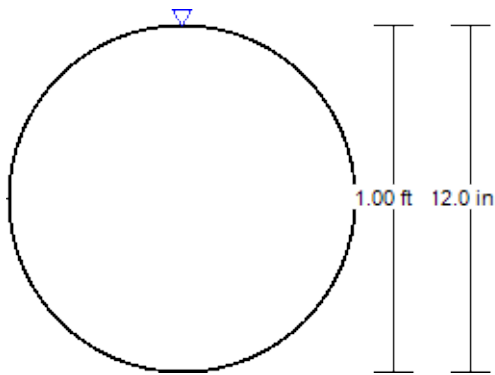
Worksheet for 12" FULL FLOW @ 5.56%

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity
Input Data	
Roughness Coefficient	0.013
Channel Slope	5.56 %
Normal Depth	1.00 ft
Diameter	12.0 in
Discharge	8.40 cfs
Results	
Discharge	8.40 cfs
Normal Depth	1.00 ft
Flow Area	0.8 ft ²
Wetted Perimeter	3.14 ft
Hydraulic Radius	0.25 ft
Top Width	0.00 ft
Critical Depth	0.99 ft
Percent Full	100.0 %
Critical Slope	5.08 %
Velocity	10.70 ft/s
Velocity Head	1.78 ft
Specific Energy	2.78 ft
Froude Number	(N/A)
Maximum Discharge	9.04 cfs
Discharge Full	8.40 cfs
Slope Full	5.56 %
Flow Type	Undefined
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	100.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	1.00 ft
Critical Depth	0.99 ft
Channel Slope	5.56 %
Critical Slope	5.08 %

Cross Section for 12" FULL FLOW @ 5.56%

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity

Input Data	
Roughness Coefficient	0.013
Channel Slope	5.56 %
Normal Depth	1.00 ft
Diameter	12.0 in
Discharge	8.40 cfs



V: 1
H: 1

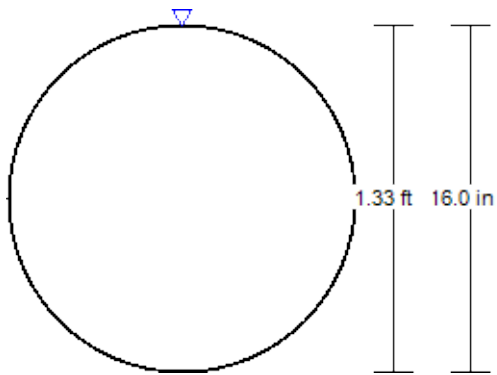
Worksheet for 16" FULL FLOW @ 1.02%

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity
Input Data	
Roughness Coefficient	0.013
Channel Slope	1.02 %
Normal Depth	1.33 ft
Diameter	16.0 in
Discharge	7.75 cfs
Results	
Discharge	7.75 cfs
Normal Depth	1.33 ft
Flow Area	1.4 ft ²
Wetted Perimeter	4.19 ft
Hydraulic Radius	0.33 ft
Top Width	0.00 ft
Critical Depth	1.10 ft
Percent Full	100.0 %
Critical Slope	1.00 %
Velocity	5.55 ft/s
Velocity Head	0.48 ft
Specific Energy	1.81 ft
Froude Number	(N/A)
Maximum Discharge	8.34 cfs
Discharge Full	7.75 cfs
Slope Full	1.02 %
Flow Type	Undefined
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	100.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	1.33 ft
Critical Depth	1.10 ft
Channel Slope	1.02 %
Critical Slope	1.00 %

Cross Section for 16" FULL FLOW @ 1.02%

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity

Input Data	
Roughness Coefficient	0.013
Channel Slope	1.02 %
Normal Depth	1.33 ft
Diameter	16.0 in
Discharge	7.75 cfs



V: 1
H: 1

T1 SYMPHONY PARK BLOCKS C&D 0
T2 ONSITE STORM DRAIN - WEST SIDE
T3 KHA JOB# 192005001 BY: MS (Start HGL = TOP OF PIPE)
SO 1000.0002025.027 18 2026.527
R 1044.9712026.187 18 .013 .000 .000 0
R 1048.9712026.263 18 .013 .000 90.000 0
R 1227.6582028.443 18 .013 .000 .000 0
R 1231.6582028.492 18 .013 .000 -90.000 0
R 1294.7932029.262 18 .013 .000 .000 0
JX 1299.9362029.325 18 12 .013 2.500 2029.608 90.0 .000
R 1329.2622029.683 18 .013 .000 .000 0
JX 1333.2622029.736 18 18 .013 2.000 2027.990 -90.0 .000
R 1394.5222030.631 18 .013 .000 .000 0
R 1411.5252030.879 18 .013 .000 .000 0
R 1427.6992031.115 18 .013 .000 .000 0
R 1445.9402031.382 18 .013 .000 .000 0
R 1463.7052031.641 18 .013 .000 .000 0
R 1484.1802031.940 18 .013 .000 .000 0
SH 1484.1802031.940 18
CD 12 4 0 .000 1.000 .000 .000 .000 .00
CD 18 4 0 .000 1.500 .000 .000 .000 .00
CD 27 3 0 .000 7.000 20.000 .000 .000 .00
CD 30 4 0 .000 2.500 .000 .000 .000 .00
CD 36 4 0 .000 3.000 .000 .000 .000 .00
CD 42 4 0 .000 3.500 .000 .000 .000 .00
CD 48 4 0 .000 4.000 .000 .000 .000 .00
CD 54 4 0 .000 4.500 .000 .000 .000 .00
CD 60 4 0 .000 5.000 .000 .000 .000 .00
CD 66 4 0 .000 5.500 .000 .000 .000 .00
CD 72 4 0 .000 6.000 .000 .000 .000 .00
Q 2.000 .0

SYMPHONY PARK BLOCKS C&D
ONSITE STORM DRAIN - WEST SIDE
KHA JOB# 192005001 BY:MS (Start HGL = TOP OF PIPE)

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd. El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia. -FT	Base Wt/ or I. D.	ZL	No Wth Prs/PIP
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	2025.027	1.500	2026.527	6.50	3.68	.21	2026.74	.00	.99	.00	1.500	.000	.00	0 .0
.000	.0258					.0038	.00	1.50	.00	.65	.013	.00	.00	PIPE
1000.000	2025.027	1.500	2026.527	6.50	3.68	.21	2026.74	.00	.99	.00	1.500	.000	.00	0 .0
3.284	.0258					.0035	.01	1.50	.00	.65	.013	.00	.00	PIPE
1003.284	2025.112	1.417	2026.528	6.50	3.76	.22	2026.75	.00	.99	.69	1.500	.000	.00	0 .0
HYDRAULIC JUMP														
1003.284	2025.112	.665	2025.776	6.50	8.60	1.15	2026.93	.00	.99	1.49	1.500	.000	.00	0 .0
9.223	.0258					.0226	.21	.66	2.13	.65	.013	.00	.00	PIPE
1012.507	2025.350	.676	2026.025	6.50	8.41	1.10	2027.12	.00	.99	1.49	1.500	.000	.00	0 .0
14.505	.0258					.0206	.30	.68	2.06	.65	.013	.00	.00	PIPE
1027.013	2025.724	.701	2026.425	6.50	8.02	1.00	2027.42	.00	.99	1.50	1.500	.000	.00	0 .0
8.437	.0258					.0182	.15	.70	1.92	.65	.013	.00	.00	PIPE
1035.450	2025.941	.727	2026.669	6.50	7.65	.91	2027.58	.00	.99	1.50	1.500	.000	.00	0 .0
5.593	.0258					.0160	.09	.73	1.79	.65	.013	.00	.00	PIPE
1041.042	2026.086	.755	2026.841	6.50	7.29	.83	2027.67	.00	.99	1.50	1.500	.000	.00	0 .0
3.929	.0258					.0141	.06	.76	1.67	.65	.013	.00	.00	PIPE
1044.971	2026.187	.784	2026.971	6.50	6.95	.75	2027.72	.00	.99	1.50	1.500	.000	.00	0 .0
4.000	.0190					.0127	.05	.78	1.55	.70	.013	.00	.00	PIPE

SYMPHONY PARK BLOCKS C&D
ONSITE STORM DRAIN - WEST SIDE
KHA JOB# 192005001 BY:MS (Start HGL = TOP OF PIPE)

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd. El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia. -FT	Base Wt/ or I. D.	ZL	No Wth Prs/PIP
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1048.971	2026.263	.803	2027.066	6.50	6.75	.71	2027.77	.00	.99	1.50	1.500	.000	.00	0 .0
130.701	.0122					.0122	1.59	.80	1.48	.80	.013	.00	.00	PIPE
1179.672	2027.858	.803	2028.660	6.50	6.75	.71	2029.37	.00	.99	1.50	1.500	.000	.00	0 .0
47.986	.0122					.0121	.58	.80	1.48	.80	.013	.00	.00	PIPE
1227.658	2028.443	.806	2029.249	6.50	6.72	.70	2029.95	.00	.99	1.50	1.500	.000	.00	0 .0
4.000	.0122					.0121	.05	.81	1.47	.80	.013	.00	.00	PIPE
1231.658	2028.492	.806	2029.298	6.50	6.72	.70	2030.00	.00	.99	1.50	1.500	.000	.00	0 .0
9.933	.0122					.0120	.12	.81	1.47	.80	.013	.00	.00	PIPE
1241.591	2028.613	.807	2029.420	6.50	6.70	.70	2030.12	.00	.99	1.50	1.500	.000	.00	0 .0
34.373	.0122					.0113	.39	.81	1.47	.80	.013	.00	.00	PIPE
1275.964	2029.032	.839	2029.871	6.50	6.39	.63	2030.51	.00	.99	1.49	1.500	.000	.00	0 .0
10.829	.0122					.0100	.11	.84	1.36	.80	.013	.00	.00	PIPE
1286.793	2029.164	.872	2030.037	6.50	6.09	.58	2030.61	.00	.99	1.48	1.500	.000	.00	0 .0
5.018	.0122					.0088	.04	.87	1.27	.80	.013	.00	.00	PIPE
1291.811	2029.226	.908	2030.133	6.50	5.81	.52	2030.66	.00	.99	1.47	1.500	.000	.00	0 .0
2.332	.0122					.0078	.02	.91	1.17	.80	.013	.00	.00	PIPE

1294.143 2029.254 .945 2030.199 6.50 5.54 .48 2030.68 .00 .99 1.45 1.500 .000 .00 0 .0
 .650 .0122 .0069 .00 .95 1.08 .80 .013 .00 .00 PIPE
 ▲ FILE: Symphony_CD_Main1.WSW W S P G W - CIVILDESIGN Version 14.06 PAGE 3
 Program Package Serial Number: 1911

SYMPHONY PARK BLOCKS C&D
 ONSITE STORM DRAIN - WEST SIDE
 KHA JOB# 192005001 BY:MS (Start HGL = TOP OF PIPE)
 WATER SURFACE PROFILE LISTING Date: 11- 9-2021 Time: 10: 34: 35

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd. El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia. -FT	Base Wt or I. D.	ZL	No Wth Prs/Pi p
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1294.793	2029.262	.986	2030.248	6.50	5.28	.43	2030.68	.00	.99	1.42	1.500	.000	.00	0 .0
JUNCT STR	.0122					.0039	.02	.99	1.00		.013	.00	.00	PIPE
1299.936	2029.325	1.466	2030.791	4.00	2.28	.08	2030.87	.00	.77	.45	1.500	.000	.00	0 .0
9.891	.0122					.0013	.01	1.47	.20	.61	.013	.00	.00	PIPE
1309.827	2029.446	1.350	2030.796	4.00	2.39	.09	2030.88	.00	.77	.90	1.500	.000	.00	0 .0
6.398	.0122					.0013	.01	1.35	.31	.61	.013	.00	.00	PIPE
1316.225	2029.524	1.272	2030.795	4.00	2.50	.10	2030.89	.00	.77	1.08	1.500	.000	.00	0 .0
5.167	.0122					.0014	.01	1.27	.36	.61	.013	.00	.00	PIPE
1321.393	2029.587	1.206	2030.793	4.00	2.63	.11	2030.90	.00	.77	1.19	1.500	.000	.00	0 .0
4.403	.0122					.0016	.01	1.21	.41	.61	.013	.00	.00	PIPE
1325.796	2029.641	1.149	2030.789	4.00	2.75	.12	2030.91	.00	.77	1.27	1.500	.000	.00	0 .0
3.466	.0122					.0017	.01	1.15	.45	.61	.013	.00	.00	PIPE
1329.262	2029.683	1.102	2030.785	4.00	2.87	.13	2030.91	.00	.77	1.32	1.500	.000	.00	0 .0
JUNCT STR	.0132					.0011	.00	1.10	.49		.013	.00	.00	PIPE
1333.262	2029.736	1.241	2030.977	2.00	1.28	.03	2031.00	.00	.53	1.13	1.500	.000	.00	0 .0
4.141	.0146					.0004	.00	1.24	.19	.40	.013	.00	.00	PIPE
1337.403	2029.797	1.179	2030.976	2.00	1.34	.03	2031.00	.00	.53	1.23	1.500	.000	.00	0 .0
3.663	.0146					.0004	.00	1.18	.21	.40	.013	.00	.00	PIPE

▲ FILE: Symphony_CD_Main1.WSW W S P G W - CIVILDESIGN Version 14.06 PAGE 4
 Program Package Serial Number: 1911

SYMPHONY PARK BLOCKS C&D
 ONSITE STORM DRAIN - WEST SIDE
 KHA JOB# 192005001 BY:MS (Start HGL = TOP OF PIPE)
 WATER SURFACE PROFILE LISTING Date: 11- 9-2021 Time: 10: 34: 35

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd. El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia. -FT	Base Wt or I. D.	ZL	No Wth Prs/Pi p
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1341.066	2029.850	1.125	2030.975	2.00	1.41	.03	2031.01	.00	.53	1.30	1.500	.000	.00	0 .0
3.310	.0146					.0005	.00	1.12	.24	.40	.013	.00	.00	PIPE
1344.376	2029.898	1.075	2030.973	2.00	1.48	.03	2031.01	.00	.53	1.35	1.500	.000	.00	0 .0
3.017	.0146					.0005	.00	1.07	.26	.40	.013	.00	.00	PIPE
1347.393	2029.942	1.029	2030.971	2.00	1.55	.04	2031.01	.00	.53	1.39	1.500	.000	.00	0 .0
2.778	.0146					.0006	.00	1.03	.28	.40	.013	.00	.00	PIPE
1350.171	2029.983	.986	2030.969	2.00	1.62	.04	2031.01	.00	.53	1.42	1.500	.000	.00	0 .0
2.565	.0146					.0007	.00	.99	.31	.40	.013	.00	.00	PIPE
1352.736	2030.021	.946	2030.967	2.00	1.70	.05	2031.01	.00	.53	1.45	1.500	.000	.00	0 .0
2.378	.0146					.0007	.00	.95	.33	.40	.013	.00	.00	PIPE
1355.115	2030.055	.909	2030.964	2.00	1.79	.05	2031.01	.00	.53	1.47	1.500	.000	.00	0 .0
2.210	.0146					.0008	.00	.91	.36	.40	.013	.00	.00	PIPE
1357.324	2030.088	.873	2030.961	2.00	1.87	.05	2031.02	.00	.53	1.48	1.500	.000	.00	0 .0
2.052	.0146					.0009	.00	.87	.39	.40	.013	.00	.00	PIPE
1359.376	2030.118	.840	2030.957	2.00	1.96	.06	2031.02	.00	.53	1.49	1.500	.000	.00	0 .0

1.898	.0146						.0011	.00	.84	.42	.40	.013	.00	.00	PIPE
1361.274	2030.145	.808	2030.953	2.00	2.06	.07	2031.02	.00	.53	1.50	1.500	.000	.00	0	.0
1.761	.0146						.0012	.00	.81	.45	.40	.013	.00	.00	PIPE

FILE: Symphony_CD_Main1.WSW W S P G W - CIVIL DESIGN Version 14.06 PAGE 5

Program Package Serial Number: 1911 WATER SURFACE PROFILE LISTING Date: 11- 9-2021 Time: 10: 34: 35

SYMPHONY PARK BLOCKS C&D
 ONSITE STORM DRAIN - WEST SIDE
 KHA JOB# 192005001 BY:MS (Start HGL = TOP OF PIPE)

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd. El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia. -FT	Base Wt or I.D.	ZL	No Wth Prs/Pip	
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1363.035	2030.171	.778	2030.949	2.00	2.16	.07	2031.02	.00	.53	1.50	1.500	.000	.00	0 .0	
1.620	.0146					.0014	.00	.78	.48	.40	.013	.00	.00	PIPE	
1364.655	2030.195	.749	2030.944	2.00	2.27	.08	2031.02	.00	.53	1.50	1.500	.000	.00	0 .0	
1.488	.0146					.0016	.00	.75	.52	.40	.013	.00	.00	PIPE	
1366.142	2030.216	.722	2030.938	2.00	2.38	.09	2031.03	.00	.53	1.50	1.500	.000	.00	0 .0	
1.349	.0146					.0018	.00	.72	.56	.40	.013	.00	.00	PIPE	
1367.491	2030.236	.696	2030.932	2.00	2.49	.10	2031.03	.00	.53	1.50	1.500	.000	.00	0 .0	
.173	.0146					.0020	.00	.70	.60	.40	.013	.00	.00	PIPE	
1367.665	2030.239	.671	2030.909	2.00	2.61	.11	2031.02	.00	.53	1.49	1.500	.000	.00	0 .0	
HYDRAULIC JUMP															
1367.665	2030.239	.402	2030.641	2.00	5.24	.43	2031.07	.00	.53	1.33	1.500	.000	.00	0 .0	
26.857	.0146					.0146	.39	.40	1.72	.40	.013	.00	.00	PIPE	
1394.522	2030.631	.403	2031.034	2.00	5.24	.43	2031.46	.00	.53	1.33	1.500	.000	.00	0 .0	
17.003	.0146					.0146	.25	.40	1.72	.40	.013	.00	.00	PIPE	
1411.525	2030.879	.403	2031.282	2.00	5.24	.43	2031.71	.00	.53	1.33	1.500	.000	.00	0 .0	
16.174	.0146					.0146	.24	.40	1.72	.40	.013	.00	.00	PIPE	
1427.699	2031.115	.403	2031.518	2.00	5.23	.42	2031.94	.00	.53	1.33	1.500	.000	.00	0 .0	
18.241	.0146					.0144	.26	.40	1.72	.40	.013	.00	.00	PIPE	

FILE: Symphony_CD_Main1.WSW W S P G W - CIVIL DESIGN Version 14.06 PAGE 6

SYMPHONY PARK BLOCKS C&D
 ONSITE STORM DRAIN - WEST SIDE
 KHA JOB# 192005001 BY:MS (Start HGL = TOP OF PIPE)

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd. El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia. -FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1445.940	2031.382	.405	2031.787	2.00	5.20	.42	2032.21	.00	.53	1.33	1.500	.000	.00	0 .0
17.765	.0146					.0137	.24	.40	1.70	.40	.013	.00	.00	PIPE
1463.705	2031.641	.414	2032.055	2.00	5.04	.39	2032.45	.00	.53	1.34	1.500	.000	.00	0 .0
3.834	.0146					.0128	.05	.41	1.63	.40	.013	.00	.00	PIPE
1467.539	2031.697	.418	2032.115	2.00	4.97	.38	2032.50	.00	.53	1.34	1.500	.000	.00	0 .0
7.329	.0146					.0118	.09	.42	1.60	.40	.013	.00	.00	PIPE
1474.867	2031.804	.432	2032.236	2.00	4.74	.35	2032.59	.00	.53	1.36	1.500	.000	.00	0 .0
3.905	.0146					.0103	.04	.43	1.50	.40	.013	.00	.00	PIPE
1478.772	2031.861	.448	2032.308	2.00	4.52	.32	2032.63	.00	.53	1.37	1.500	.000	.00	0 .0
2.387	.0146					.0091	.02	.45	1.40	.40	.013	.00	.00	PIPE
1481.160	2031.896	.463	2032.359	2.00	4.31	.29	2032.65	.00	.53	1.39	1.500	.000	.00	0 .0
1.486	.0146					.0079	.01	.46	1.31	.40	.013	.00	.00	PIPE
1482.646	2031.918	.479	2032.397	2.00	4.11	.26	2032.66	.00	.53	1.40	1.500	.000	.00	0 .0

.906	.0146					.0069	.01	.48	1.23	.40	.013	.00	.00	PIPE
1483.552	2031.931	.496	2032.427	2.00	3.92	.24	2032.67	.00	.53	1.41	1.500	.000	.00	0 .0
.478	.0146					.0061	.00	.50	1.15	.40	.013	.00	.00	PIPE
1484.029	2031.938	.514	2032.452	2.00	3.74	.22	2032.67	.00	.53	1.42	1.500	.000	.00	0 .0
.151	.0146					.0053	.00	.51	1.07	.40	.013	.00	.00	PIPE

FILE: Symphony_CD_Main1.WSW W S P G W - CIVILDESIGN Version 14.06
 Program Package Serial Number: 1911 PAGE 7

WATER SURFACE PROFILE LISTING
 SYMPHONY PARK BLOCKS C&D
 ONSITE STORM DRAIN - WEST SIDE
 KHA JOB# 192005001 BY: MS (Start HGL = TOP OF PIPE)

Date: 11- 9-2021 Time: 10: 34: 35

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd. El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia. -FT	Base Wt or I.D.	ZL	No Wth Prs/Pl p
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1484.180	2031.940	.533	2032.473	2.00	3.55	.20	2032.67	.00	.53	1.44	1.500	.000	.00	0 .0